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JURUPAITE—A NEW MINERAL

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The crystalline limestone capping the granodiorite at Crestmore, near Riverside, California, furnishes an excellent illustration of localization in the development of minerals by hydrothermal metamorphism of the limestone, which was originally crystallized by contact with the igneous mass. In this later metamorphism the calcite was recrystallized into large rhombohedral cleavage masses, some having a rich blue color. The localized character of the metamorphism was evidenced by the daily blasting of the quarry face bringing to light bands or zones of blue calcite, each with its distinctive association of minerals. Since most of these interesting associations were in calcite which could be used for cement, they soon disappeared and apparently the same occurrence was not repeated. The blue calcite, xanthophyllite, monticellite, wilkeite, crestmoreite and riversideite, described by the writer[1] were abundant for a short time, but on a visit to the quarry last summer not one of them was found.

The mineral described here and named *jurupaite* after the Jurupa Mountains, of which the Crestmore Hills are a part, is from the Commercial quarry and, like the other minerals of this quarry, probably was abundant but is now represented by one specimen only.

The jurupaite occurs filling a cavity or fissure in a mass of bluish calcite which also contains cinnamon-brown grossularite. It forms compact aggregates of white radiating fibrous spheres of varying sizes, the largest measuring about two centimeters in diameter. The fibers radiate from sharp centers so that sectors of the mineral have needle-like points similar to the pectolite of

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[1] Minerals associated with the crystalline limestone at Crestmore, Riverside County, California. *Univ. of Calif. Publications, Bull. Dept. Geol.*, 10, 327, 1917.

Paterson, New Jersey; (compare frontispiece of this number) and the mineral closely resembles this pectolite in other respects. In the center of the specimen a small amount of white chalcedony occurs filling the space between the surfaces of the spheres, and the solutions depositing it have slightly altered the rims of the jurupaite. The fibers are soft and silky without brittleness, but across fibers the hardness is about 4. Specific gravity = 2.75.

The mineral is probably monoclinic. The fibers have oblique extinction, at an angle of 31° to the elongation. The elongation is positive and the mineral is positive. Indices of refraction by immersion are:

Parallel to elongation 1.576 ± 0.002; normal to elongation 1.568 ± 0.002; double refraction about 0.007.

Jurupaite fuses easily (at 2) to a clear white glass. It is easily soluble in dilute HCl without gelatinization. It gives no color with phenolphthalein. Duplicate analyses of the mineral gave:

	1.	2.	Mean	Ratio		Approximate ratio
SiO_2	48.81	48.93	48.87	.814		2
CaO	38.55	38.78	38.66	.690	.795	2
MgO	4.38	4.01	4.19	.105		
H_2O	7.84	7.94	7.89	.438		1
	99.58	99.66				

The composition is thus $2(Ca, Mg)O.2SiO_2.H_2O$ in which the ratio of CaO : MgO = 7 : 1 approximately. Calculated with this ratio the theoretical composition is:

SiO_2 48.78, CaO 39.83, MgO 4.06, H_2O 7.32%.

While it is impossible to state that the magnesia occurs simply as a replacement of calcium and may vary in amount, it is believed that it is an integral part of the mineral because of the localized crystallization of the jurupaite.

The water is held tenaciously by the fibers, less than one percent being lost at 120°, the heat of a Bunsen failing to completely dehydrate the mineral. This seems to be true of all the fibrous calcium silicates of the quarry and all of them can be considered as derivatives of orthosilicic acid rather than as simple hydrous metasilicates. The formula proposed for jurupaite is therefore $H_2(Ca, Mg)_2Si_2O_7$.

Crestmoreite and riversideite are examples of this localized development in a different zone in the limestone, where the orthosilicic solutions carried the phosphate and sulfate and both minerals may be considered as calcium orthosilicates having

PO_4, SO_4 and CO_3 as essential constituents included in the molecule.

There is still a great abundance of yellowish green vesuvianite at the quarry, and the granular masses contain seams and veinlets of white, minutely fibrous calcium silicates, showing differences in indices and amount of hydration. They indicate that quite a range of fibrous calcium silicates exist with similar ratios of CaO to SiO_2 and with indices governed by the amount of water present. The new mineral, plazolite, described by Foshag[1] occurred imbedded in these seams and its close similarity to garnet should be noted. In its crystal form, physical properties, high index and anomalous birefringence, and chemical composition the mineral suggests garnet. It lacks but one molecule of SiO_2 to make it a pure calcium garnet, but, on the other hand, contains CO_2 and H_2O, evolved at high temperature. Instead of a true garnet forming, a hydrated crystallization has taken place, having certain of the characteristics of a garnet.

TSUNASHIRO WADA

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By the death of Dr. Tsunashiro Wada, of Tokyo, on December 20, 1920, Japan has lost one of her leading scientific men. His attainments earned for him a wide recognition in America and Europe, and they were duly rewarded in his native land, where he so eminently occupied many of the most important stations in the institutions of geology, mineralogy, mining and mettallurgy.

He was born March 15, 1856, at Obama, province of Wakasa, Japan. His studies were pursued at the Imperial University of Tokyo, and in 1875 he was appointed an assistant professor there. In 1878 he entered the service of the Home Department, and in 1880 became its Director. In 1880, also, he became Director of the Imperial Geological Survey of Japan, and delivered lectures in Mineralogy and Lithology at the Imperial University. The Japanese Government chose him as the national representative to the International Geological Congress at Berlin in 1884, and on his way thither he was enabled to visit several American and European countries. On his return to Japan he was appointed, in 1885, Professor of Mineralogy and Lithology in the Imperial University, holding this professorship until 1891, without ceasing to be Director of the Geological Survey, to which office he added, in 1889, that of Director of the Imperial Mining Bureau of Japan. These positions as director he held until 1893, when the pressure of his other duties obliged him to resign them. In 1894, he was again active as a lecturer in the University of Tokyo, and his thoro knowledge of mining led to his appointment to the post of Technical Adviser to the Imperial Household Department.

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[1] Plazolite, a new mineral. *This Journal*, **5**, 183, 1920.

Even before the completion of the great Japanese Steel Works in 1900, at a cost of $10,000,000, Dr. Wada's great practical experience in mining induced his selection in 1897 as president of the undertaking. This was followed in 1899 by another season of travel in Europe and America by Government order. In 1901 he resigned the presidency of the Steel Works, where his services had so greatly promoted the iron and steel industry of Japan; an important measure having been the conclusion of the purchase contract with the Daiya Iron Mine in China, a step that much facilitated the extension of the steel works in later days, thus contributing in no small degree to the victory of Japan over Russia in 1905. In 1902, he made extensive journeys thru North and Middle China, accompanied by a group of engineers and geologists, and wrote a splendid paper on the lapidary work of precious stones in China. Then he devoted himself to a careful study of the mines and of the economic geology of the country. Dr. Wada served as director and juror in the mining and metallurgical section of each of the Japanese National Expositions, of which the first was held in 1877 and the latest in 1901.

From 1896 to 1908 he was president of the Japanese Institute of Mining Engineers (The "Nippon Kogyoki"). In 1905 he was offered a new field for his activity, when the late Prince Ito made him General Adviser in Mining to the Korean Government, and he retained this position after Prince Ito's death and after the annexation of Korea to Japan. An association of the principal mine-owners of Japan (The Kosan Konwa Kai) was organized by him in 1908. On December 9, 1910, he was elected an honorary member of the American Institute of Mining Engineers.[1] It is needless to state what he did to welcome the Institute party during the Japan excursion of 1911. The Metallurgical Research Institute (Kinzo-ku-Kogyo Kenkyu-Sho) was formed by him in 1916, and he presided over it. The same year marked the purchase of the Cottrell Patent from the International Precipitation Company of Los Angeles, so that it could be applied to smelters and factories in Japan, and the success of this acquisition has given eloquent testimony of his foresight and the accuracy of his judgment. In 1917 he was nominated by the Emperor a member of the House of Peers, being practically the first and the only representative of the mining experts to have a seat in that body. On several occasions Dr. Wada has been decorated with medals by the Emperor of Japan and by the governments of various other nations. On the report of his critical condition, he was promoted by one rank to the fourth rank of the Senior Grade, and by two orders from the fourth to the second Order of Merit.

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[1] *Bull. Am. Inst. Mining Eng.*, Jan., **1911**, 5.

He was survived by his wife, Madame Saki, by four sons, Mikio, Goro, Rokuro and Schichiro, and by three daughters, now Mrs. S. Sakuma, Mrs. T. Hasegawa and Mrs. I. Gota.

Dr. Wada's publications include a work on mineralogy, written when he was but twenty years of age. To this succeeded in 1877, two volumes, one entitled "Crystallography," the other "The Mineral Industry of Japan"; of this latter work he published, in 1904, in Japanese and English, an enlarged and revised edition, the "Minerals of Japan," with numerous photographs of crystals. In 1893, when he resigned as director of the Geological Survey and The Imperial Mining Bureau, he recorded his long experience in a work entitled "The Mining Industry of Japan during the last twenty-five years, 1867–1893," issued by the Mining Bureau, Department of Agriculture and Commerce of Japan, 1893. Since 1904, Dr. Wada has issued in Tokyo successive supplements to his "Minerals of Japan," under the German title "Beiträge zur Mineralogie von Japan."[1] In spite of the German name, the articles in this serial publication are almost all in English. It is also well worthy of note that he had assembled the greatest collection of fine Japanese minerals.

A few items from Dr. Wada's "Minerals of Japan" give us some idea of the resources of this land in the precious metals and gem stones. Of gold he remarks (p. 12): "Formosa stands at the front of the gold-producing regions of Japan. The chief localities are Zuiho and Kimkwaseki, near Taihoka in the northeastern part of the island." Alluvial gold occurs in numerous places in the Japanese islands of Honshu and Hokkaido (Yeso) as well as in Formosa, the richest of these deposits being in Hokkaido. The largest nugget came from the mining district of Esashi; it weighed 769.2 grams (nearly 25 ounces troy) and was worth about $500. Platinum and iridosmine are found in association with gold in the Yubari-gawa and Pechan, and in other rivers of Hokkaido (p. 8). Of course, as is well known, copper is the chief metallic product of Japan.

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[1] George F. Kunz, "Minerals of Japan," *Science* [N.S.] **47**, 45–46, Jan. 11 1918.

The first of the gem-stones are the topazes (pp. 89–113). These occur in pegmatite veins in granite, for example, Takayame and Hosokut, Mino Province, and Ishigure, Ise Province. The first exhibition of Japanese topazes was at the National Exposition of Tokio in 1877. Besides colorless stones, there have been found those of the following hues: wine-yellow, or bluish-yellow; pale blue; jade brown and pale blue in sectors; pale-green, and brown. This latter hue in only observable in recently extracted stones, as on exposure to daylight the brown and brownish-yellow topazes shade into blue and later tend to become colorless. Other gem-stones, occasionally of gem quality, are the amethysts of Fujiya, Hoki Province and the rose quartz of Gota, Maki Province; fine crystals of vivianite, and also transparent blue tourmaline crystals, these occuring at Takayama, Mino Province, where beryl has been found as well; a pale greenish-yellow crystal of chrysoberyl was discovered at this locality, in stanniferous sand (p. 82).

Dr. Wada's work on the mining industry of Japan[1] embraces a brief historical section, which contains many interesting items. He finds that the name of Columbus "is directly connected with the mines of Japan," for the discoverer was animated by a wish, to reach the precious-metal treasures of Zipangu (Japan), of which he had read Marco Polo's description.

Japanese mining is stated to date back to a period between the seventh and the beginning of the eighth century of our era. In this period gold, silver, copper, tin, iron, cinnabar and lead were extracted in exceedingly small quantities. In the ninth century mining industry exhibited considerable progress, and from this date the Tada silver mine, the Ikuno gold mine, the

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[1] Wada, Tsunashiro, "The mining industry of Japan during the last twenty-five years, 1867–1892," printed at the Tokyo Tsukijo Type Foundry, 1893. 304 pp., 5 maps and plans, 4to.

Yoshioka copper mine, the Handa silver mine and several other mines which are still being operated successfully in our day.

The author notes the wonderful mineral wealth of Japan, the coal deposits in Hokkaido and Kiushu, the antimony in Shikoku and Kiushu, and the gold, silver, copper and iron of these and other provinces. In the order of production copper occupies the first rank, next come gold and silver, followed by coal, antimony, manganese and sulfur. The methods of working employed in the mines at present, and all the most important details relating to them, are given at great length and very satisfactorily. The processes of smelting and refining are treated of in an equally thoro way, and the statistics of the production down to 1890 or a little later are also presented.

Especially valuable are the data regarding deposits, and the careful characterization of the particular qualities of the coal and the minerals extracted.

TEXAS, LANCASTER COUNTY, PENNSYLVANIA

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This locality, which includes two townships, is a relict of the days when precise statement of the source of a mineral was considered an unnecessary refinement. The district, named from New Texas, a small village in Fulton township, lies along the Pennsylvania-Maryland line between the Susquehanna River and Octoraro Creek, and may be reached from Conowingo on the Pennsylvania Railroad (Columbia and Port Deposit Branch) on the west, or from Sylmar on the Penna. R. R. (P. W. & B. R. R., Maryland Division) on the east. All the localities lie in the northern part of the Havre de Grace quadrangle, and will be referred to below in ninth-coördinate symbols.

The rocks of the region comprise an igneous complex overlain by mica-schists.[1] All these rocks have been intruded by a fine grained gray granitic gneiss, and pegmatite. From south to north the igneous rocks appear in the order: granodiorite, gabbro, norite, and meta-peridotite and meta-pyroxenite (serpentine, etc.), possibly representing a section of a batholithic mass which had undergone differentiation *in situ*. The mineral localities occur chiefly in the serpentine area along the state line, which contains deposits of chromite, and albite pegmatites.

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[1] The Maryland geology has been described by F. Bascom: *Maryland Geological Survey, Cecil County*, 83–148, 1902.

The writer will begin the trip at Philadelphia, leaving Broad Street Station (Penna. R. R.), for Havre de Grace, Md. (2 hrs. ride). Here a change of trains is made to the Columbia and Port Deposit branch. This is along the Susquehanna River, filled with numerous picturesque islands. At Port Deposit the train passes large quarries in granodiorite, to be succeeded by cuts in gabbro just before reaching Conowingo.

From the station the way lies up the gorge of Conowingo Creek past whitewashed boulders of norite. Just north of Oakwood, the norite passes into serpentine, which underlies an area characterized by the natives as "the Barrens"; which is truly descriptive of the stretches covered with scrub pines, cedars, and oaks, often entangled with a luxurious growth of green briars.

A side excursion may be here made to Wiant's spar quarry, on Conowingo Creek, 1.2 kilometer (¾ mile) northeast of Pilot, Md. (H. de G. 1642). The rock is an albite pegmatite, intrusive in serpentine. At the margins of the pegmatite are contact zones of brown vermiculite, green actinolite, and talc. Green radiations of actinolite occur in the white albite, representing magnesian material that had been assimilated by the pegmatite in its intrusion. Druses of minute albite crystals are abundant, and rarely minute highly modified beryl crystals. Other quarries in albite are located on a small run, 1 km. west of Rock Springs cross-roads (H. de G. 1636)[2]; 1 km. southeast of the cross-roads (2428); and 3 km. northeast of the cross-roads, just west of the Octoraro (2522).

Just before reaching the Rock Springs cross-roads, masses of chalcedony and drusy quartz, due to weathering of the serpentine, will be noticed in the road cut (H. de G. 2441).

The Line Pit (Low's mine) is situated on the Pennsylvania-Maryland line, about 1.2 km. (¾ mile) northwest of Rock Springs cross-roads, and but a hundred meters north of the Pleasant Grove road (H. de G. 1632). In 1918 the mines were reopened for a short period, and again in 1920. It produced the fine williamsite and kammererite which graced the older collections. The orebody is a roughly cylindrical mass with the

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[1] Probably the source of the albite described by Silliman, *Am. J. Sci.* [2], **8**. 389, 1849.

diameters 1.2 by 2.1 meters, pitching to a depth of over 80 meters at an angle of 60°. This cylindrical mass is sheathed by a zone of jade like williamsite from a few cm. to 5 dm. in thickness, beyond which lies typical green and brown serpentine. Williamsite also forms thick veins thru chromite, which frequently contains partings of purplish kammererite. Magnesite was quite common at a depth of 60 meters, forming thick veins cutting more or less horizontally across the orebody and the serpentine; which circumstance throws some doubt on the belief that magnesite is a product of surface solutions, causing the pendulum of modern paragenetic thought to swing still further and include even magnesite in the category of minerals produced by hydrothermal solutions. All these minerals may be found on the dumps.

Two other old chrome mines lie 1 km. northeast (Red Pit, H. de G. 2178), and 1.2 km. northeast (Jenkins' mine, H. de G. 2184) of the Line Pit. Of interest from a genetic point of view is an old iron mine in the woods about ½ km. northwest of the Red pit (H. de G. 2171.9). In this case a segregation of magnetite occurred instead of chromite. Large masses of the mineral may be found on the dump.

Rock Springs run rises in the vicinity of these mines, and flowing northward empties into Carter's run, near the confluence of this stream and Conowingo Creek. The run takes its name from several springs about 2.5 km. (1.5 m.) north of Rock Springs cross-roads, which lies in Maryland. Near this point a branch enters the main run, the bed and banks of which is the old locality for chalcedony, moss-agate, and drusy quartz[1] (H. de. G. 2149).

A small run empties into Conowingo Creek, about 1 km. west of the Line Pit, or 1.5 km. southeast of Pleasant Grove. In the woods at the foot of the hill just south of this point (H. de. G. 1388), boulders of granite gneiss contain xenoliths of talc enclosing bright green, radiating crystals of actinolite, quite resembling specimens from the Zillerthal.[2]

The Boice farm, the famous locality of the pyrite crystals occurring in symmetrical combinations of cube, octahedron and pyritohedron, has been variously given by writers as north, one mile west, one mile northwest, and one mile west by south to Texas. The old name of the farm has been long forgotten by the inhabitants of the vicinity. The locality of the pyrite crystals is about 1.8 km. (1.2 m.) north of Pleasant Grove, just east of the Wakefield road, or 1.5 km. west by south of Texas (Lyles P. O.) (H. de G. 1315.3). The crystals occur in a field near the contact of the serpentine and the mica schists, being found in both these rocks, but especially developed in a talcose schist which probably occurs at the boundary of the two rocks. The best specimens occur in the latter rock. Numerous boulders of the rocks are found in the field, filled with symmetrical cavities from which pyrite crystals have been weathered, or with the crystals themselves which have assumed a brown coating of limonite. As noted above the mica schists and the serpentines have been invaded by later dikes of a fine grained grayish granite, finely exposed in the railroad cuts along the Susquehanna. This rock frequently contains pyrite, while crystals are quite common in the mica schists. The crystals of the Boice farm locality probably were deposited by solutions arising from the intrusive along the contact of the serpentine and the mica schists.

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[1] George W. Carpenter, *Am. J. Sci.*, **10**, 224, 1825.

[2] First listed by Carpenter (*Am. J. Sci.*, **14**, 10, 1828) as "green compressed crystals of actinolite in talc, on Joel Jackson's farm." This is distinct from the mineral listed by Dana, (1850, 655), as "green tourmaline in talc;" the exact locality of which is, however, unknown.

About ½ km. southeast of the pyrite locality are the old magnesite pits (H. de G. 1316.8), mentioned in the Second Geological Survey reports.

Turning eastward, our last objective is Wood's chrome mine: the source of all that is magnificent in brucite. From Pleasant Grove the road leads back to Rock Springs cross-roads. The Wrightsdale road is taken for 0.9 km. (½ mile) to the state line, where the road to the east is taken. In a hollow just southwest of the Wrightsdale fork, and distant about 2 km. from that village lies Tyson Reynold's mine (H. de G. 2247). Just beyond the next cross-roads, Little Britain township is entered. The road from here on has been closed to general traffic, but it will be found to be quite passable on foot. The way lies along Octoraro Creek, past excellent exposures of contorted mica schists. At the end of the road, a trail along the north bank of the creek may be followed until the mine is reached.

Wood's mine lies within the ox-bow of the Octoraro, about 1.2 km. southwest of Lee's Mill, and about 8 km. (5 miles) northwest of Rising Sun, Md., or Sylmar, Pa., the nearest railroad points (H. de G. 2248). The main pit was worked to a depth of 230 meters, but is now filled with water. Enormous dumps extend to the westward of the pit, consisting chiefly of green serpentine, which has become brown on the surface on weathering. The locality is as barren of specimens today as it was prolific of fine brucite, genthite, zaratite, and hydromagnesite in 1857. The orebody was described[1] as having been "300 feet long in its greatest extension, with a width of 10 to 35 feet, dipping 40 to 60° to a depth of 720 feet." The strike was nearly east and west on the surface, and nearly north and south on the lower levels. Ocasionally veins of chromite extended into the walls.

A smaller mine (Carter's mine), was situated about ½ km. to the east, just west of the Wood farm house (H. de G. 2349).

PROCEEDINGS OF SOCIETIES

PHILADELPHIA MINERALOGICAL SOCIETY

Academy of Natural Sciences of Philadelphia, May 12, 1921

A stated meeting of the Philadelphia Mineralogical Society was held on the above date with the president, Dr. Hawkins, in the chair. Seventeen members and visitors were present.

Mr. George L. English gave a delightful talk on "Mineral Collecting a Generation Ago." An account was given of Clarence Bement and his Sunday School class attended by Jefferis, Leidy, Vaux, Hancock, Willcox, Kunz, and other prominent mineralogists. Personal recollections were given of Egleston, Tyson, Rand, Genth, Koenig, Roth, and Hidden. Mr. English then described his early mineralogical experiences in North Carolina, western United States, Greece, Italy, and Elba. Mr. George Vaux, Jr., and Mr. Charles Toothaker contributed some reminiscences of Dr. Leidy. The president expressed the thanks of the society to the speaker for his most interesting talk.

Mr. John Frankenfield was appointed secretary pro tem during the absence of the secretary in South America. A collection of Delaware County minerals presented by the late Thomas Harvey, and a Goldschmidt two-circle goniometer were exhibited. The secretary called attention to the fact that h_0 of the 1920 model of this goniometer can be very rapidly made 0°, thus saving considerable time in calculations. The telescope is set about 70° from the collimator and permanently clamped. A reflecting surface such as the small mirror coming with the apparatus is mounted parallel to the vertical circle, V, and carefully centered, so that the signal remains on the cross-hairs upon rotation of V. The horizontal circle is then turned to 0°, and clamped. The two screws that clamp the horizontal bar (carrying the vertical circle) to the bed are loosened, and this bar is swung, independent of the horizontal circle, until the signal is again at the cross-hairs. The screws are now tightened, and $h_0 = 0°$.

Samuel G. Gordon, *Secretary.*

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[1] William Glenn: *Second Geol. Survey Pa. Rept.* C3. Lancaster County, 192, 1880.

NEW MINERALS

FAMILY 9. SILICATES

R'''—HYDROXY-ORTHO-SILICATES

TOERNEBOHMITE

PER GEIJER: The cerium minerals of Bastnäs at Riddarhyttan. *Sveriges Geol. Undersökning, Årsbok (Swedish Geol. Survey, Yearbook)*, **14**, No. 6, 24 pp., 1920; this mineral, pages 16–20.

NAME: After the late A. E. Törnebohm, a pioneer in the geological study of the Archean rocks of central Sweden.

PHYSICAL PROPERTIES

Color, light green to olive; luster vitreous. H. 4.5; sp. gr. 4.94. Shows no crystal faces, but from optical properties and relations with allanite is inferred to be monoclinic.

OPTICAL PROPERTIES

Refractive indices near those of cerite ($\beta = 1.81$), but double refraction much higher: $\gamma - \alpha = 0.030$, tho $\beta - \alpha$ is but 0.001. Biaxial, with a moderate axial angle; $2E = 49°$, $2V$ probably about 26°. Sign +. Dispersion very strong, $v > \rho$. Remarkably pleochroic, with α light rose to greenish yellow, β bluish green, and γ light rose; absorption $\beta > \alpha = \gamma$. It is striking that there is a marked difference in absorption between axes which show little difference in index.

CHEMICAL PROPERTIES

Material was carefully selected for analysis so as to avoid admixture of cerite, allanite, and bastnaesite. Minute amounts of chalcopyrite and molybdenite could not be separated, but these introduce no difficulty. Slowly soluble in hot concentrated HCl. The small sample obtained was analyzed by R. Mauzelius, giving: SiO_2 22.05, Ce_2O_3 27.52, $(La, Nd)_2O_3$ 34.85, Al_2O_3 8.55, FeO 1.91, MnO 0.05, MgO 0.49, CaO 0.23, F_2 0.29, ign. 1.70, chalcopyrite 0.96, insol. 0.95, sum 99.55%. This is regarded as corresponding essentially to $H_2O : 3R_2O_3 : 4SiO_2$, or $R_3(OH)(SiO_4)_2$. It is suggested to be related to topaz and to cerite.

OCCURRENCE

Occurs in the cerite ore, tho more closely associated with allanite than with the cerite. It might be supposed to be the original mineral from which the cerite has been derived by hydration, but paragenetically it appears to be later than the cerite, and as no intermediate stages can be recognized, this view is untenable.

The balance of the paper is taken up with a detailed description of this rare-earth deposit and its minerals. The principal of these are bismuthinite, molybdenite, chalcopyrite, linneite, quartz, magnetite, bastnaesite, lanthanite, malachite, fluocerite, actinolite, allanite, cerite, and talc. The fluocerite is a new report; it has been recognized optically; compare following abstract. The bastnaesite occurs in individual grains, and as alteration products; new optical data on it ($\omega = 1.7225$) are given. The allanite (orthite) is usually stated to contain only 0.3 to 0.5% H_2O, but analysis by Mauzelius showed the correct figure to be 1.52%, so that the formula corresponds well with that of the epidote group. Cerite, the mineral in which cerium was discovered, occurs only at this locality. It has been regarded as variable in composition, but analyses have mostly been made on altered material, and the most nearly correct one appears to be Nordström's, which gives 2(Ca, Fe)O : 3(Ce, La, $Nd)_2O_3$: $6SiO_2$: $3H_2O$. Its β is about 1.81.

The deposit is believed to be a contact-metamorphic replacement of limestone.

DISCUSSION

[May be regarded as established, altho there are some uncertainties about the formula which it is to be hoped will be cleared up by the subsequent finding and study of better material. E. T. W.]

DISCREDITED MINERALS.

FAMILY 3. HALIDES.

"Tysonite" (Dana No. 182) = Fluocerite (No. 196)

PER GEIJER: Fluocerite and tysonite. *Geol. För. Förh.*, **43** (1), 19–23, 1921.

Optical study of a specimen of fluocerite from the collection of Berzelius, who first described the mineral, as well as of other fluocerites and of tysonite, has shown the essential identity of all of them (Dana gives "tysonite . . . fluocerite pt."). They differ only in extent of alteration. Crystallographic and chemical evidence, which have been supposed to indicate their difference, are discussed in detail, and the discrepancies are accounted for. The name fluocerite, having priority, should be used for the species. Its formula should be stated as is now done for tysonite, (Ce, La, $Nd)F_3$, and the oxyfluoride formula of Weibull (accepted by Dana) discarded. E. T. W.

NOTES AND NEWS

The delay in the issue of this and the preceding number has been caused by the compositors' strike. It may be several months before we get back to normal again, and we ask subscribers to wait a few weeks before assuming that their copies have been lost in the mails.

Mr. Samuel G. Gordon of the Academy of Natural Sciences of Philadelphia has started on a trip to South America in the hope of obtaining some mineral specimens for the William S. Vaux Collection of the Academy.

ABSTRACTS—MINERALOGY

SOLUTION AND GROWTH FORMS OF QUARTZ FROM SODIUM TETRABORATE SOLUTIONS HEATED UNDER PRESSURE. GABRIEL LINCIO. Turin. *Beitr. Kryst. Min.*, 1, No. 3, 87–101, 1916.

[Nos. 1 and 2 of Goldschmidt's Beiträge were abstracted in our previous volume, Feb., 1920; some additional numbers have now reached this country, and will be abstracted.]

Spheres of quartz were placed in a pressure apparatus in contact with a solution of borax, so arranged that one could be heated and the other cooled. Growth and solution figures were obtained, the crystallographic features of which are described, with the aid of numerous figures. The trigonal symmetry is well brought out, and light is thrown on the mechanism of solution and deposition. E. T. W.

AN IMPROVED SEPARATION VESSEL FOR HEAVY SOLUTIONS. Gabriel Lincio. *Beitr. Kryst. Min.*, **1**, No. 3, 103–105, 1916.

STIBNITE FROM FELSŐBANYA. Oscar Neff. Heidelberg. *Beitr. Kryst. Min.*, **1**, No. 3, 107–157, 1916.

An elaborate study of over 100 crystals, yielding 17 forms new to the mineral and 11 others new to the locality, also a few probably new but uncertain ones. The entirely new forms are: (100), (520), (530), (540), (650), (5.5.11), (225), (229), (2.2.11), (293), (10.16.21), (2.10.9), (326), (296), (4.15.12), (563), and (6.8.15). Data as to rank of forms, angles, irregularities, etc., are given Numerous drawings of the crystals are included. E. T. W.

REPORT ON THE DISCOVERY OF DIAMONDS AT ABOMOSA, NORTHWEST OF KIBBI, EASTERN PROVINCE, GOLD COAST. A. E. Kitson. Govt. Press, Accra, Gold Coast, 1919; thru *Min. Abstr.*, **1**, 16, 1920.

Small diamonds were found in Feb., 1919 in the gravels of the Abomo Su and the neighboring streams. 175 stones weighed 4–13/32 carats, the largest 1/8 carat. Good crystals showing octahedron and dodecahedron were observed. The gravels contain also topaz, zircon, black sand, garnet, corundum, rutile, and tourmaline in addition to quartz. The association suggests a granite-pegmatite origin. W. F. H.

THE ALA VALLEY AND ITS MINERALS. Emilio Repossi. *Riv. Sci. Nat. "Natura," Pavia*, **10**, 89–132, 1919; thru *Min. Abstr.*, **1**, 13, 1920.

A detailed description of 11 localities in this region renowned for its wealth of minerals. The minerals occur in bands in the serpentine and include garnet, vesuvianite, diopside, epidote, apatite, clinochlore, magnetite, olivine and titanolivine, albite, prehnite, sphene, etc. Copper, cobalt and nickel minerals have been found in the mountains south of the Valley. [A copy of this article has been received by the Editor from its author; this will gladly be loaned to any one expecting to visit the region, and who wishes to translate it.] W. F. H.

THE PECULIAR SULFUR SPHERULES PRODUCED IN A CRATER LAKE OF THE VOLCANO SHIRANE, KÔZUKE, JAPAN. R. Ôhashi. *J. Akita Mining Coll.*, No. **1**, 1–10, 1919.

Hollow spherical bodies of S float on the surface of the boiling crater-lake, while grains and vertical tubes of S are found in the mud at the bottom. Ascending H_2S passing thru molten S below the mud is believed to explain these occurrences. Three types of S are represented by this volcano, (1) pneumatolytic, around solfataras and in the fissures, (2) hydatogene, as beds of flour-sulfur in the crater lakes, and (3) from fusion, at the bottom of the crater lakes. W. F. H.